

Naval Research Laboratory

Stennis Space Center, MS 39529-5004



NRL/MR/7440--02-8275

System Documentation for the Geospatial Information DataBase (GIDBTM) System Server Version 2.0

FRANK McCREEDY

ROY LADNER

RUTH WILSON

JOHN BRECKENRIDGE

SUSAN CARTER

HILLARY MESICK

DAVID OLIVIER

KEVIN SHAW

*Mapping, Charting, and Geodesy Branch
Marine Geosciences Division*

CARL BARIBAULT

TODD LOVITT

*Planning Systems Incorporated
Stennis Space Center, MS*

June 24, 2002

Approved for public release; distribution is unlimited.

20020708 147

REPORT DOCUMENTATION PAGE

*Form Approved
OMB No. 0704-0188*

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE (DD-MM-YYYY) June 24, 2002			2. REPORT TYPE Memorandum			3. DATES COVERED (From - To)	
4. TITLE AND SUBTITLE System Documentation for the Geospatial Information DataBase (GIDB™) System Server Version 2.0			5a. CONTRACT NUMBER				
			5b. GRANT NUMBER				
			5c. PROGRAM ELEMENT NUMBER				
6. AUTHOR(S) Frank McCreedy, Roy Ladner, Ruth Wilson, John Breckenridge, Susan Carter, Hillary Mesick, David Olivier, Kevin Shaw, Carl Baribault,* and Todd Lovitt*			5d. PROJECT NUMBER 74-8100-02				
			5e. TASK NUMBER				
			5f. WORK UNIT NUMBER				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Research Laboratory Marine Geosciences Division Stennis Space Center, MS 39529-5004			8. PERFORMING ORGANIZATION REPORT NUMBER				
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) National Guard Bureau-CounterDrug Office Georgia Tech Research Institute Baker Building On Dalney Road, Room 241B Atlanta, GA 30332-0841			10. SPONSOR / MONITOR'S ACRONYM(S)				
			11. SPONSOR / MONITOR'S REPORT NUMBER(S)				
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.							
13. SUPPLEMENTARY NOTES *Planning Systems Incorporated, Stennis Space Center, MS 39529-5004							
14. ABSTRACT The Geospatial Information DataBase (GIDB™) offers a fully Object Oriented (OO) database approach to managing the input, storage, retrieval, and presentation of geospatial data in relation to a specific user defined area of interest (AOI). It uses both public domain and commercial OO database management systems (DBMS) technology to store and retrieve the data and can present this information in both 2D and 3D perspective views. It also offers the flexibility to query spatial data with reference to time and space.							
15. SUBJECT TERMS Geospatial Information DataBase System, Object Oriented (OO) database							
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON Frank McCreedy		
a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified	UL	22	19b. TELEPHONE NUMBER (include area code) (228) 688-4678		

1.0 Introduction	1
2.0 Installation	1
2.1. Primary Components	1
2.1.1. Apache	1
2.1.2. Servlet Engine	1
2.1.3. Java™ Virtual Machine	1
2.1.4. Java™ 3D API	2
2.1.5. OO DBMS	2
2.1.6. GIDB Servlets	2
2.1.7. GIDB Drivers	2
2.2. Installation Steps	2
2.2.1. Step1-Install Apache Web Server	2
2.2.2. Step2-Install the Tomcat Servlet Engine	3
2.2.2.1. Set up DTED Paths	3
2.2.2.2. Setup WorkingDirectory	4
2.2.2.3. Copy GIDB2 Client Software	4
2.2.3. Step3-Installing Ozone OO DBMS	4
2.2.3.1. Identify Necessary Files	4
2.2.3.2. Ozone OODBMS	4
2.2.3.3. Ozone Database Repository	5
2.2.3.4. Installing a populated database	5
2.2.3.5. Installing an empty database	5
2.2.3.6 Starting the Ozone Server	6
2.2.3.7 Setting up a Windows Service	6
2.2.3.8 Starting/Stopping the service	8
2.2.4. Avoiding Installation Difficulties	8
2.2.4.1. Database Servers	8
2.2.4.2. Metcast	8
2.2.4.2.1. Windows 98	10
2.2.4.2.2. Windows NT 4.0/2000	10
3.0 Managing the GIDB Database Servlet Environment	11
3.1. Entering GIDB Database Servlet Connection Parameters	11
3.2. Database Server Administrator	11
3.3. Input (for new database connection)	14
3.4. New Database Server Info	15
3.5. Available Servers	16
4.0 Other Significant Issues	18
5.0 Troubleshooting	18
6.0 Conclusions	19
7.0 Acknowledgements	19
8.0 Points of Contact	19
9.0 References	19

**SYSTEM DOCUMENTATION FOR THE
GEOSPATIAL INFORMATION DATABASE (GIDB™) SYSTEM SERVER
VERSION 2.0**

1.0 Introduction: The Geospatial Information DataBase System (GIDB™) offers a fully Object Oriented (OO) database approach to managing the input, storage, retrieval, and presentation of geospatial data in relation to a specific user defined area of interest (AOI). It uses both public domain and commercial OO database management systems (DBMS) technology to store and retrieve the data and can present this information in both 2D and 3D perspective views. It also offers the flexibility to query spatial data with reference to time and space.

The GIDB utilizes the Java™ programming environment to structure, retrieve and manipulate digital representations of real world phenomena as points, lines, polygons and raster objects. Most often it uses open source OO-DBMS, (e.g., Ozone) or commercial Hybrid Relational/OO-DBMS (e.g., Oracle®) as the data storage mechanism for its object structure. A primary goal of the GIDB is to foster the advancement of Geospatial Information Technology (GIT) by encouraging the use of advanced OO database techniques for spatial data storage, retrieval and presentation. GIDB constitutes a more integrated approach to spatial data architectures and encourages the development of new and improved techniques for defining both spatial and temporal relationships among real world data entities. This document describes the common steps involved with the installation; maintenance and update of the GIDB System Server on most Microsoft Windows™ based Server systems.

2.0 Installation: The installation of GIDB as a Server involves installing several software components and any database repository appropriate to the mission being supported by the server. Each of these pieces must be fully functioning prior to publishing the GIDB as a client server application on a local Microsoft Windows™ based Server system.

2.1. Primary Components: The following components are needed to provide a full implementation of the GIDB Server.

2.1.1. Apache – The Apache Web Server, Current Version 1.3.22 provides an open-source HTTP server for most common desktop and server operating systems. It is the primary component for managing web-based client-server relationships to deliver information over the World Wide Web. [1]

2.1.2. Servlet Engine – A Web Server for the implementation of Servlet containers and Java™ Server pages. Currently the Jakarta Tomcat v3.2.4 servlet engine is being utilized by the GIDB, although other JAVA based engines could also be utilized. [2] GIDB also requires the mod-jk.dll file be resident and implemented to establish proper communications between Apache and Tomcat.

2.1.3. Java™ Virtual Machine – Current Java Development Kit (JDK v. 1.3.1). [3] GIDB also requires that Sun Microsystems’® Java™ JRE v. 1.4.0 be resident on the host server. [4]

2.1.4. *Java™ 3D API* - The Java 3D™ API is a hierarchy of Java™ classes that serve to provide library functions for sophisticated three-dimensional graphics and sound rendering. Java 3D provides high-level constructs to create and manipulate 3D data. [5]

2.1.5. *OO DBMS* - Ozone and/or other open-source or commercial database engine. The primary purpose of the DBMS is to store the spatial geometry, and to store and manage structures and relationships used to render that geometry. [6]

2.1.6. *GIDB Servlets* – Java™ Servlet technology allows web developers a mechanism for extending the functionality of a web server and other systems. “A servlet can almost be thought of as an applet that runs on the server side”...[2]

2.1.7. *GIDB Drivers* – These drivers support connections to remote databases and make up the primary functionality of the portal connectivity. A good example of these drivers is the GIDB’s connection to the Fleet Numerical Meteorology and Oceanography Center (FNMOC) Metcast. Linking to this request-reply and subscription (channel) system for distributing weather information allows GIDB to readily integrate this data with other information it supplies.

2.2. Installation Steps: The following sections describe the basic components required to provide a full implementation of the GIDB Server. Installers for each of the components are stored on the GIDB™ Server CD-ROM included at the end of this document. Each component may also be downloaded from a web site identified in the References section of this document. A directory space named GIDB2srvr can be created on the host server to provide an area where installation files may be temporarily stored. By doing so, the user can selectively monitor the size of this space by deleting files after each component is successfully installed.

An alternative method would be to simply copy the GIDB2srvr directory from the CD-ROM to the host server’s hard drive. In either case, this temporary workspace will be used to unzip the installation files for each of the GIDB system components. Also identify a main hard drive on the host under which all GIDB components will be installed. This is usually the C:\ drive, but may be any other resident hard drive.

2.2.1. Step1-Install Apache Web Server: Prior to installing Apache, one should use the host Control Panel to launch the services manager. Any web servers currently started should be halted during Apache installation to avoid

possible conflicts. Once these are halted, the installation of the Apache server can continue.

First install and implement the Apache Web Server on the host server machine. Apache may be installed by opening the Apache directory within the enclosed CD-ROM and double clicking the Apache1.3.zip file. The user should 'select all' files listed with the zip archive, and select the 'Extract' feature. When prompted with a browse dialogue window, select the Apache1.3 directory within the host's temporary install directory, or use the 'Create New Folder' option to create a new directory labeled Apache1.3 under the host GIDB2srvr directory. The primary directory path for this installation requires that all Apache related files reside in <apache>/htdocs. On a first time installation of the Apache to a host, the htdocs directory can be copied from an existing GIDB installation. However, in cases where Apache is already installed and used on the host, care must be given to leave previously existing htdocs files intact. The DMS portal web page should be in /dms, while GIDB is in /GIDB and CMIS is in /CMIS. These directories should be able to be moved and an alias added without much trouble if desired.

The mod.jk.dll (stored on the installation CD-ROM) must be copied to the directory /apache/modules. Also, the httpd.conf file from ~/Apache/conf should be edited to change any directory parameters that may point to the wrong path (i.e., change all h: to drive letter where Apache resides).

2.2.2. Step2-Install the Tomcat Servlet Engine: If Tomcat does not already reside on this host machine, copy the Tomcat directory from the installation CD-ROM into the hard drive identified for GIDB, (i.e., c:\tomcat). Otherwise, if Tomcat already exists on the host, simply copy the Tomcat directory from the CD-ROM to the host GIDB2srvr directory. In this case the files listed below will need to be selectively added to the existing Tomcat directory.

This installation requires that a number of classes exist to implement various servlets. These classes are located in <tomcat>/webapps/ROOT/WEB-INF/classes. The GIDB servlets use resources that are contained in .jar files and these are located in <tomcat>/webapps/ROOT/WEB-INF/lib (any .jar placed in this directory is automatically placed into the classpath used by Tomcat).

There are a couple of parameters that the GIDBDatabaseServlet needs in order to function. These are specified in <tomcat>/webapps/ROOT/WEB-INF/web.xml. Specifically, they are the DTED Paths and the GIDB2 Servlet Working Directory.

The executable file jk_nt_service.exe must also be moved to any directory under the gidb2 installation level and executed. This establishes communication between Apache and Tomcat. Once executed, this file must reside in this location permanently.

Similar to the edit of the httpd.conf in the Apache installation, the Tomcat wrapper_properties file in ~/tomcat/conf should be edited to insure the correct directory path to tomcat is used, (i.e., h:\ changed to c:\).

2.2.2.1. Set up DTED Paths: This sets up an understanding of the directory structure where Digital Terrain Elevation Data resides. (*Note: Although this parameter is no longer actually used, its removal will result in the crash of the servlet*). Future versions should correct this problem. The user can create a directory named DTED under the primary GIDB2 directory or wherever they choose, (i.e., c:\gidb2\dted)

2.2.2.2. Setup WorkingDirectory: The working directory for the GIDB has the value of c:\gidb2servetworkingdirectory. The GIDBDatabaseServlet database drivers use this directory as scratch space for storing temporary and residual files generated during the GIDB executions.

2.2.2.3. Copy GIDB2 Client Software: The client software for GIDB2 includes .jar files that execute under the ~/Apache/htdocs/gidb2 directory. These include a Microsoft® Installer™ script called GIDB2setup.exe. Once executed, this installer will prompt the user for information needed to install the GIDB2 application.

2.2.3. Step3-Installing Ozone OO DBMS: Installing the Ozone

2.2.3.1. Identify Necessary Files: Your installation CD should contain the following Ozone files:

ozone06.jar
jta.jar
xerces.jar
jta-spec1_0_1.jar
ozoneInst.bat
ojvm.bat
ozoneEnv.bat
invkr153.zip

2.2.3.2. Ozone OODBMS: The Ozone OODBMS consists of a series of Java jar files. These are:

ozone06.jar

jta.jar
xerces.jar
jta-spec1_0_1.jar

The first in the list, ozone06.jar, contains the Java files that are core to the Ozone OODBMS. The other jar files contain related files that Ozone needs to function properly.

These jar files must be copied to your web-server directory. In the GIDB-System, that will be tomcat\tomcat\webapps\ROOT\WEB-INF\lib. Tomcat automatically loads these jar files when it is started.

Since Ozone is an open source OODBMS, many developers and users have access to the source code. We have modified the source code that is downloadable from the Ozone web site to provide an implementation of Ozone is that beneficial to the way the GIDB-System operates. The GIDB-System will not function properly with a different version of Ozone.

2.2.3.3. Ozone Database Repository:

The GIDB install may include a populated GIDB-database (i.e., respository). This consists of numerous data files named and organized by the Ozone OODBMS. If a populated database is not included, then it will be necessary to set up a directory to received data imported into Ozone using tools provided with the gidiibii_pkg.jar file (explained elsewhere).

2.2.3.4. Installing a populated database:

If you have been supplied a populated GIDB-database, then you have either one or more tapes or CDs containing the database. The top-level folder containing the data will be named ‘oz.’ Copy this folder to a location on your hard drive. You may copy the ‘oz’ folder to a sub-folder as long as no folder above the ‘oz’ folder contains the string “oz.” For example, the GIDB-database may be copied to c:\GIDB_Database, resulting in c:\GIDB_Database\oz. It may not be copied to c:\OzoneDatabase because “OzoneDatabase” contains the string “oz.” This restriction is currently due to the file naming convention used by Ozone, and will be eliminated in a future release.

2.2.3.5 Installing an empty database:

Caution: A word of caution is offered to the steps involved in this section. You will be asked to open a command window. Among other tasks in that window you will be asked to set the system variables, *classpath* and *path*, in preparation for installing the empty Ozone database. Once you are finished with this window, you should exercise caution in reusing this window for the purpose of running other JAVA applications, where the the values dictated for system variables, *classpath* and *path*,

may be different. Instead, open another command window if you need to run another JAVA application, where you can set the system variables as dictated by that application.

To install an “empty” database, create a folder or sub-folder named ‘oz’ as explained above. Let’s assume that it is created as ‘c:\oz.’

Copy the files ozoneInst.bat, ojvm.bat and ozoneEnv.bat to a folder on your hard drive other than the ‘oz’ folder. Let’s assume these are copied to c:\Ozone\bin.

Open a command window. Then change directories to where the ‘.bat’ files were copied. Set the classpath with the following command:

```
set classpath=
c:\tomcat\webapps\ROOT\WEB-INF\lib\ozone06.jar;
c:\tomcat\webapps\ROOT\WEB-INF\lib\jta.jar;
c:\tomcat\webapps\ROOT\WEB-INF\lib\xerces.jar;
c:\tomcat\webapps\ROOT\WEB-INF\lib\jta-spec1_0_1.jar
```

This should be entered as one continuous string with NO spaces and on one line with NO ‘enter key’ until the very end.

Set the PATH with the following command:

```
set PATH=%PATH%;c:\Ozone\bin
```

Set OZONE_HOME with the following command:

```
set OZONE_HOME=c:\Ozone
```

Type the command ‘ozoneInst.bat.’ This will create the necessary sub-folders and configuration files in the c:\oz folder. This is an empty repository that contains no data but is ready for data import.

2.2.3.6 Starting the Ozone Server

The Ozone Server is a process that runs in the background and handles requests for data from the GIDB-portal. Requests are handled on the port specified in ‘oz\config.properties.’ The port specified in the “OzoneSettings.txt” file that is used by the Database Server Administrator to connect the GIDB-portal to the GIDB-database must match the port number in ‘oz\config.properties.’

This section describes how to set this up as a Windows Service and how to start and stop the service. Having the Ozone Server as a Windows Service will result in automatic startup of the server whenever the machine is

rebooted. Stopping and restarting the server without a machine reboot will also be easier.

2.2.3.7 Setting up a Windows Service

This procedure involves installing invoker.exe and then running invoker.exe. Invoker.exe is an application that allows you to create a windows service.

Unzip invkr153.zip and follow the directions in invoker_readme.txt to install.

Follow these steps to create a Windows Service for the Ozone Server:

1. At the command prompt enter the command to install the service with the following syntax (use double quotes as indicated):

```
invoker install Ozone_Server "Ozone Server" "c:\jdk1.3.1\bin\java.exe"  
automatic false
```

2. Parameters must be passed to the Ozone Server at startup. To accomplish this, open the registry editor (regedit32.exe) and navigate to where your service was created:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Ozone_Server\Parameters

Double-click on the AppParameters value. Type in the following parameters that will be passed to the Java executable when the service is started (Be sure to use double-quotes as indicated):

```
-Xmx900m  
-DENV_PATH=e:\  
-classpath  
"c:\tomcat\webapps\ROOT\WEB-INF\lib\ozone06.jar;  
c:\tomcat\webapps\ROOT\WEB-INF\lib\gdbii_pkg.jar;  
c:\tomcat\webapps\ROOT\WEB-INF\lib\rstree.jar;  
c:\tomcat\webapps\ROOT\WEB-INF\lib\DatabaseInterfaceModule.jar;  
c:\tomcat\webapps\ROOT\WEB-INF\lib\MetocDatabaseInterfacePkg.jar;  
c:\tomcat\webapps\ROOT\WEB-INF\lib\spatialblob.jar;  
c:\tomcat\webapps\ROOT\WEB-INF\lib\visad.jar"  
org.ozoneDB.core.Server -de:\oz -usherlock
```

- a. The above should be entered as a single line. The 'e:\' and 'e:\oz' should be edited to reflect the path to where you installed your GIDB-database data repository.

- b. The ‘-ushерlock’ may have to be edited to reflect the username (be sure to keep the ‘-u’ command switch on this line) that you wish to use for all access to this GIDB-database. This username must match the one fixed in the “OzoneSettings.txt” file that is used by the Database Server Administrator to connect the GIDB-portal to the GIDB-database.
- c. The ‘-Xmx900m’ switch assigns a maximum of 900 mb of memory to the Java virtual machine. This setting assumes a machine with about 2 gb of memory. If your machine has 1 gb, it is suggested to change this setting to ‘-Xmx500m’. If your machine has 500 mb of memory, it is suggested that you change this setting to ‘0Xmx256m’.
- d. Finally, the classpath may also have to be edited to reflect the path to your installation of tomcat.

2.2.3.8 Starting/Stopping the service

Open the Services Control Panel. On Windows 2000 this is Start → Settings → Control Panel → Administrative Tools → Services.

High-light ‘Ozone Server.’ Right-click and select ‘Start.’ To stop the service, right-click and select ‘Stop.’

Note: If you restart this service, then you should restart tomcat. If you stop this service and allow it to remain stopped, it is advisable to restart tomcat to clear all references to the GIDB-database.

2.2.4. Avoiding Installation Difficulties:

2.2.4.1.Database Servers: When the computer is booted, Apache and Tomcat automatically start. The actual database servers used by GIDB have to be manually started (they run as servlet instances under Tomcat, so any time that Tomcat is restarted the individual servers must be restarted). The way to start servers is to run the server administrator. This is located in c:\gidb2\server\administrator\. The administrator is invoked: “Java™ –jar GIDB2ServerAdministrator.jar” from the command line. The first window prompts you for a server to administrate. Put in “dms2.gtri.gatech.edu” and port 80. Then you will see a screen listing the currently running servers. You can load server profiles, create new ones, save ones that you have created, and drop servers that are running. We have already made several server profiles that can be loaded to easily start servers. They are located in a subdirectory called “gidbdriverconfigs”. The main ones we usually test with are the ones for oracle, ozone and fnmoc. Just load the appropriate profile file and press the button to start the server. The following paragraphs describe individual database drivers currently used by GIDB.

2.2.4.2. Metcast: the Commander, Naval Meteorology and Oceanography Command (CNMOC) operates the Metcast server for the purpose of serving near real time meteorological and atmospheric conditions data to the Naval community. Metcast installation instructions for use with the GIDB (MS Windows® only) are presented in the following section. Several prerequisites are needed to begin installation of Metcast, including

1. Authorization from FNMOC for use of the Metcast retriever, including id and password,
2. JDK 1.3 or higher installed
3. Core GIDB installed, and
4. Winzip installed

The following files must also be included in the Metcast installation process:

<u>Name</u>	<u>Description</u>
<i>MetcastClient.exe</i>	Complete software from FNMOC for installing Metcast
<i>invkr153.zip</i>	Service creator tool, Invoker, from http://www.idetix.com/support_files.htm
<i>MetcastDatabaseInterfacePkg.jar</i>	Jar file for GIDB interface to Metcast
<i>omnicast.jar</i>	Jar file for GIDB interface to Metcast
<i>cygwin1.dll</i>	dll file for GIDB interface to Metcast
<i>wgrib.exe</i>	exe file for GIDB interface to Metcast
<i>productlist.dtd</i>	dtd file for GIDB interface to Metcast
<i>CatalogToMBLMap.txt</i>	txt file for GIDB interface to Metcast
<i>FNMOC.txt</i>	Text file for configuring GIDB's FNMOC Database server
<i>FNMOC2.txt</i>	“...FNMOC2...”
<i>FNMOC3.tx</i>	“...FNMOC3...”
<i>GIDB2ServerAdministrator.jar</i>	jar file for GIDE's Database Server Administrator tool (from \Spartacus\dmap\gidb2\development\sherlock)\administrator

<i>GIDB2ServerAdministrator.bat</i>	bat file for GIDB's Database Server Administrator tool
<i>Metcast_readme.txt</i>	readme file for GIDB interface to Metcast
<i>fnmoc_metcast_pg.pdf</i>	FNMOC's Metcast API document
<i>fnmoc_metcast_ip_15series.pdf</i>	FNMOC's Metcast install document
<i>fnmoc_metcast_um_15series.pdf</i>	FNMOC's Metcast client user's manual

Step 1. Install by running MetcastClient.exe and configure Metcast as per FNMOC's API document excerpted below from the document *fnmoc_metcast_pg.pdf*>

1. Download and install Metcast onto the machine on which you wish to do development. Authorized users may download Metcast for Windows and Solaris via the following link:

<http://www.fnmoc.navy.mil> (DOD level 1 or 2 access is required). Metcast for HP-UX 10.20 is available via DII-COE.

Note: Department of Defense (DOD) staff and authorized contractors may request access authorization from the Fleet Support Office via the following link:

<http://www.fnmoc.navy.mil/PUBLIC/ADMIN/request.html>.

2. Download and install the Java Software Developers Kit (SDK) version 1.3 that applies to your platform. Download links for various platforms are provided below:

Windows 98/NT/2000:

<http://java.sun.com/j2se/1.3/download-windows.html>

Sun Solaris 2.51/2.6/7:

<http://www.java.sun.com/j2se/1.3/download-solaris.html>

HP-UX 10.20/11.00 :

http://www.hp.com/products1/unix/java/java2/sdkrte1_3/downloads/index.html.

3. Certain environment variables need to be configured on your system before you begin developing software to interface with the Omnicast Retriever. These variables are the PATH and CLASSPATH variables. The PATH environment variable needs to be set so that the directory that includes the Java binaries is included in the default path. The CLASSPATH environment variable needs to point to four Java archive files as well as the current directory so that the Java runtime can find the necessary libraries that are required to run the Omnicast Retriever.

2.2.4.2.1. Windows 98

In Windows 98, do the following:

1. Bring up the autoexec.bat file with notepad or sysedit. The autoexec.bat file is located at c:\ if c is your boot drive.
2. Add the following lines to the end of the autoexec.bat file to specify the PATH and CLASSPATH environment variables for the JDK:

```
SET PATH=C:\JDK1.3\bin;%PATH%
SET CLASSPATH=.;C:\JDK1.3\lib\classes.zip
SET
CLASSPATH=C:\jmwin\noddsfls\lib\omnicast.jar;%CLASSPAT
H%
SET CLASSPATH=C:\jmwin\noddsfls\lib\kiwi.jar
```

3. Save the edits you made in the autoexec.bat file.
4. Reboot your computer for the changes to take effect.

2.2.4.2.2 Windows NT 4.0/2000

In Windows NT 4.0/2000, do the following:

1. In the control panel, select System.
2. Select the Environment tab and add an environment variable named CLASSPATH; set its variable to the following:
;C:\JDK1.3\lib\classes.zip;C:\jmwin\noddsfls\lib\omni
cast.jar;C:\jmwin\noddsfls\lib\kiwi.jar
3. If you have an existing PATH environment variable, edit it so that C:\JDK1.3\bin; (including the semicolon) is added to the beginning of the current PATH value.

<end of excerpt from fnmoc_metcast_pg.pdf>

Step 2. Install Invoker tool for creating automatic services from executables.

- a. Unzip the contents of invoker.zip into c:\winnt\system32.
- b. Confirm operation by entering "invoker /?" at the command line.

Step 3. Create an automatic service for the Metcast retriever.

- a. Locate the executable for the Metcast retriever,
..\\jmwin\\noddsfls\\omniRetriever.exe
- b. At the command prompt enter the command to install the service with the following syntax:
invoker install service_name "Service Label" "executable"
startup_type interactive
service_name = name used internally by SCM
service_label = display name for the Services Control Panel in double-quotes

executable = path to executable (use double-quotes for long file/folder names)
startup_type = service startup type: automatic, manual (default), disabled
interactive = service can interact with the desktop: true, false (default)
For example (all on one line):
invoker install MetcastRetriever "Metcast Retriever"
"D:\fnmoc\jmvwin\noddsfls\omniRetriever.exe" automatic
c. Confirm appearance of the item for Metcast Retriever in the MS services window, and start the service.
Note: for uninstalling the service see the invoker_readme.txt file.

Step 4. Install an icon on the desktop for the Metcast Retriever Monitor. The executable for the Metcast Retriever Monitor is ..jmvwin\noddsfls\RetrieverMonitor.exe.

Step 5. Confirm operation of connections for Metcast local and remote services.

- a. Start the Metcast client via desktop icon or start menu FNMOC-SPAWAR/Metcast Client 1.5.0.1.
- b. Start the Metcast Retriever Monitor.
- c. Select the tab Current Sessions in the Monitor window for use in monitoring activity in the steps below.
- d. Observe entries for Catalog and Globals, both with status OK. Otherwise, if status is Problem, then select the item and press Details in order to discover if remoter server is down, etc. For more info, see the sections on known problems and workarounds in the following:
fnmoc_metcast_um_15series.pdf and FNMOC's Metcast client user's manual
- e. Close the Metcast client. See note below.

Note: The Metcast Retriever service maintains an internal log of results of current and past remote sessions. Unfortunately, the Metcast client erases the content of that log at startup in order to avoid loss of the log, it is important to keep the Metcast client closed at all times during normal operation of the GIDB interface to Metcast.

Step 6. Install and start GIDB interface to Metcast

- a. Copy the interface jar files to
c:\tomcat\webapps\ROOT\WEB-INF\lib
- b. Copy the following files to the directory
c:\gidb2servetworkingdirectory\metcast:
cygwin1.dll (the .dll file for GIDB interface to Metcast),
wgrib.exe (the .exe file for GIDB interface to Metcast) and

CatalogToMBLMap.txt (the .txt configuration file for GIDB interface to Metcast)

- c. Copy the following file to the directory
c:\gidb2servetworkingdirectory\metcast\data:
productlist.dtd (the .dtd file for GIDB interface to Metcast)
- d. Restart tomcat from the MS services window.
- e. Start the GIDB Database Server Administrator via the following batch file: GIDB2ServerAdministrator.bat (the .bat file for the GIDB's Database Server Administrator tool) *Note: Ensure that the batch file is in the same directory as the following jar file:* GIDB2ServerAdministrator.jar (the .jar file for GIDB's Database Server Administrator tool from \\Spartacus\dmap\gidb2\development (sherlock)\administrator)
- f. Copy the FNMOC<x>.txt files to C:\Documents and Settings\<dmap user>.
- g. From the Administrator window start the 3 FNMOC database servers loading from the FNMOC<x>.txt files.

Step 7. Invoke each of the 3 FNMOC services from the GIDB applet, e.g., via the spool-shaped toolbar button, and confirm OK status of the resulting sessions in the monitor window under the tab Current Sessions or Past Sessions.

Also, see the following for troubleshooting the Metcast connection software:

Metcast_readme.txt readme file for GIDB interface to Metcast
fnmoc_metcast_pg.pdf FNMOC's Metcast API document
fnmoc_metcast_ip_15series.pdf FNMOC's Metcast install document.

3.0 Managing the GIDB Database Servlet Environment:

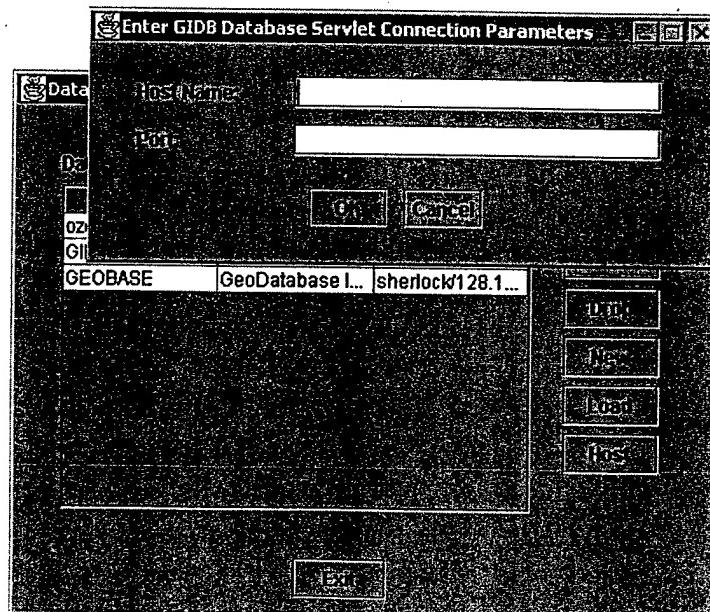
The following sections describe the steps of managing the general operation of the server.

3.1 Enter GIDB Database Servlet Connection Parameters

The first window that appears asks you for host name and port number. Enter the desired host name and port number, and click



3.2 Database Server Administrator



The next window that appears is the main window. The selectable list **Database connections** contains the current database connections.



- Click this button to refresh the list.



- Click this button to drop the selected database connection.



- Click this button to create a new database connection. You will be prompted for connection parameters in a pop-up window entitled *Input*. See below for a discussion on the *Input* window.



- Click this button to create a new database connection based on parameters in a text file. You will be prompted for the name of the text file in a pop-up window



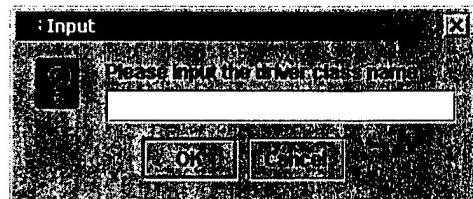
Note: See 'Available Servers' in Section 3.5 for a list of text files and descriptions of content for the available databases.



- Click this button to change the host on which the database connections are to be viewed and/or edited. You will be prompted for a new host name and port number via the pop-up window *Enter G/DB Database Servlet Connection Parameters* discussed earlier. **Note:** All connections that you've made or observed on the previous host will be preserved.

3.3 Input (for new database connection)

Enter the desired class name and click **OK** to close the window. You will be prompted for new connection parameters via a pop-up window entitled *New Database Server Info*. See below.



3.4 New Database Server Info

Enter or confirm the desired values for the various parameters.

Create - Click this button to create the new connection and close the window. The new connection will appear in the list of connections in the main window. See *Database Server Administrator* discussed earlier.

Save - Click this button to save the current set of parameters in a text file. You will be prompted for the name of the text file in a pop-up window



3.5 Available Servers

Filename	Name	Description	Layers
FNMOC.txt	FNMOC Data Server	Provides data available as a metcast client.	COAMPS, NOGAPS, weather data, weather forecasts
FNMOC2.txt	FNMOC Data Server – alternate site	Provides data available as a metcast client.	COAMPS, NOGAPS, weather data, weather forecasts
FNMOC3.txt	FNMOC Data Server – alternate site	Provides data available as a metcast client.	COAMPS, NOGAPS, weather data, weather forecasts
GeobaseServerProfile.txt	Oracle Geo Database Server	Provides access to vector data in an ESRI SDE geo database.	shapefiles
OracleServerProfile.txt	Oracle GIDB Database Server	This server provides access to both raster and vector data stored in NRL's Oracle GIDB Database.	CADRG, CIB, shapefiles, user-defined datasets
OzoneSettings.txt	Ozone GIDB Database Server	This server provides access to both vector and raster data stored in NRL's Ozone GIDB Database.	CADRG, DNC, MSDS, VMAP, DTOP, shapefiles, user-defined datasets, and DTED for 3D rendering
WMSAgThreat.txt	World Agricultural Threat to Environment	The ESRI Agricultural Threats to the Environment map service illustrates the relative levels of environmental threat posed by agricultural activity.	Agricultural threats to the environment, boundary lines, capital cities, country boundaries, major cities, oceans and seas, rivers, water bodies
WMSBasemap.txt	ESRI World BaseMap	The ESRI World Basemap map service includes data layers from a variety of ESRI data sets, including ArcWorld, ArcAtlas, Digital Chart of the World, and Data and Maps.	Airports, boundaries, boundary lines, continents, country boundaries, drainage lines, land and oceans, major cities, major railroads, major roads, oceans and seas, place names, populated places, rivers, streets and railroads, water bodies
WMSBioclimatic.txt	ESRI World Bioclimatic Soils Region	The ESRI Bioclimatic Soil Regions map service contains snow cover polygons, country boundaries, and city locations for the world.	boundary lines, capital cities, country boundaries, major cities, oceans and seas, rivers, soil regions, water bodies
WMSFloodRisk.txt	ESRI U.S. Flood Risk Zones	The U.S. Federal Emergency Management Agency Digital Q3 Flood Data displayed here is developed by scanning the existing Flood Insurance Rate Map (FIRM) hard copy and capturing a thematic overlay of flood risks.	FEMA Q3 Data Coverage, flood hazard areas, major U.S. cities, populated places, U.S. cities, U.S. state boundaries
WMSGlobalMaxTemp.txt	NASA Global Maximum Temperature	NASA Global Maximum Temperature.	?
WMSGlobalTopography.txt	NASA Global Topography	Global Topography. NASA demonstration.	?
WMSGLOBESchools.txt	NASA GLOBE Schools	NASA GLOBE Schools.	?
WMSLandscape.txt	ESRI World Landscape Zones	The ESRI Natural Landscape map service contains snow cover polygons, country boundaries, and city locations for the world.	Boundary lines, capital cities, country boundaries, landscape zones, major cities, oceans and seas, rivers, water bodies
WMSLanduse.txt	ESRI World Landuse Zones	The ESRI Land Use map service contains land use polygons, country boundaries,	Boundary lines, capital cities, country boundaries, land use, major cities,

		and city locations for the world.	oceans and seas, rivers, water bodies
WMSLastFrontierForests.txt	World Resources Institute The Last Frontier Forests	Frontier forests are the world's remaining large intact natural forest ecosystems—undisturbed and large enough to maintain all of their biodiversity.	Capital cities, continents, country boundaries, frontier forests, major cities, non-frontier forests, oceans and seas, water bodies
WMSMineral.txt	ESRI World Mineral Resources	The ESRI Mineral Resources map service contains country boundaries, city locations, and mineral locations for the world.	Boundary lines, capital cities, countries, major cities, mineral – large, mineral – medium, mineral – small, mineral – very large, oceans and seas, rivers, water bodies
WMSNatElevData.txt	USGS National Elevation Data	USGS National Elevation Data.	Puerto Rico NED Shaded Relief, US NED Shaded Relief
WMSSnow.txt	ESRI World Snow Cover	The ESRI Snow Cover map service contains snow cover polygons, country boundaries, and city locations for the world.	Boundary lines, capital cities, country boundaries, major cities, oceans and seas, rivers, snow cover days, water bodies
WMSSuperfund.txt	EPA Superfund and Toxic Sites	This map service presents Superfund and Toxics Release Inventory (TRI) sites in the United States. Superfund sites are uncontrolled or abandoned places where hazardous waste is located, possibly affecting local ecosystems or people.	Major inland water bodies, major rivers, national parks, non-U.S. Land, oceans and seas, populated places, rivers and streams, U.S. cities, U.S. counties, U.S. highways, U.S. states, urban areas, water bodies
WMSTerraVisionTerrainModel.txt	SRI's Web Mapping Server Interface for TerraVision terrain models	TerraVision terrain models.	Earth – globe, U.S. Boundaries image
WMSTransportationDensity.txt	ESRI World Transportation Network Density	The ESRI Transportation Density map service contains transportation density polygons, country boundaries, roads and railroads, airports, and city locations for the world.	Airport, boundary lines, capital cities, country boundaries, major cities, oceans and seas, rivers, streets and railroads, transportation, water bodies
WMSVegetation.txt	ESRI World Vegetation	The ESRI Vegetation map service contains vegetation polygons, country boundaries, and city locations for the world.	boundary lines, capital cities, country boundaries, major cities, oceans and seas, rivers, vegetation zones, water bodies
WMSWorldElevation.txt	ESRI World Elevation Zones	The ESRI Elevation Zones map service contains elevation zone polygons, country boundaries, and city locations for the world.	boundary lines, capital cities, country boundaries, elevation zones, major cities, oceans and seas, rivers, water bodies
WMSWorldPrecipYr.txt	ESRI World Precipitation Zones	The ESRI Precipitation map service contains annual precipitation polygons, country boundaries, and city locations for the world.	boundary lines, capital cities, country boundaries, major cities, oceans and seas, population/sq km, rivers, water bodies
WMSWorldPopDensity.txt	ESRI World Population Density	The ESRI Population Density map service contains population density polygons, country boundaries, and city locations for the world.	boundary lines, capital cities, country boundaries, major cities, oceans and seas, precipitation - year, rivers, water bodies

WMSWorldTempYr.txt	ESRI World Temperature Zones	The ESRI Temperature Zones map service contains temperature zone polygons, country boundaries, and city locations for the world.	boundary lines, capital cities, country boundaries, major cities, oceans and seas, rivers, temperature - year, water bodies
--------------------	------------------------------	--	---

4.0 Other Significant Issues: Most of the files identified here can be moved on the file system. However, a main cause of installation problems is when the servlet working directory and the raster/DTED locations are not properly identified. If you change the servlet-working directory you must also change that parameter in the .xml file. If you move the raster or DTED data (currently in f:\nrldata\cib, f:\nrldata\cadrg, f:\nrldata\dted) you'll also need to re-import their metadata into oracle and ozone. For oracle, you can run c:\RPF2Oracle\importcadrg.bat to import cadrg and c:\RPF2Oracle\importcib.bat to import CIB metadata (*Note: You must first edit the .bat file to point to the correct directory for the rasters/dted*). For ozone, you must run c:\ozonebatchfiles\rundbmanager.bat. You must then select "manage name table" and then pick q:\oz\nametable.wizard. Then you must delete the names dted root and raster root. You should then edit importdted.bat and importrpf.bat (located in the same directory) so they point to the correct directory and run them. It may take several minutes to import all of the metadata.

If ozone is moved from q:\oz to f:\nrldata\oz, the ozone management .bat files need to be edited so that –DENV_PATH points to the correct location (Note: This is the step needed for Tomcat in wrapper.properties that was mentioned earlier in this document).

The user/password for the GIDB website is available upon request from the Naval DMAP staff and can be reset to the local system manager's preference. Each individual server is also password protected. The user/password for all of them is currently test/test, but this can also be modified in the server profile files to the system manager's preference.

GIDB client can be run inside a web browser, and also by invoking it with "Java™ – jar GIDBClient.jar". Running standalone (Java™ –jar) is generally more reliable than running inside a browser. To use 3D you must install Java™ 3D on the computer you wish to use it on. These items are explained in further detail on the following web site: <http://dms2.gtri.gatech.edu/gidb2/gidb2.html>.

The folders c:\jvmwin and c:\gidbtometcast are applications needed by the fnmoc server. There is also a service used by the fnmoc driver called "Metcast Retriever". This has to be running in order to pull any data from fnmoc.

Don't hesitate to call (228-688-4678) or email (frank.mccreedy@nrlssc.navy.mil) if you run into any problems.

5.0 Troubleshooting: Unfortunately, troubleshooting any malfunctions of the GIDB installation is not a straightforward operation. Each of the steps above needs to be

revisited to insure that they have been completed accordingly. If this does not reveal any obvious problems, a full deletion of all data files may be needed, followed by repeat of the steps listed in this document.

6.0 Conclusions: Installation of the GIDB™ System in a server mode is a somewhat complex operation, but can be carried out by system administrators that have a reasonable understanding of the Microsoft Windows™, JAVA Applet and JDK environments. Care should be given to ensure that pathnames and file types are adhered to during the installation.

7.0 Acknowledgements: National Guard Bureau-CounterDrug Offices funded the development of this System Documentation for the GIDB System Server under program OMANG. NGB-CD support to this effort has helped to insure that installation of the GIDB as a server environment can be implemented in an efficient and timely manner.

8.0 Points of Contact: Currently, DMAP points-of-contact for installation help are:

Ruth Wilson, (228) 688-4525, ruth.wilson@nrlssc.navy.mil and
Frank McCreedy, (228) 688-4678, mccreedy@nrlssc.navy.mil

9.0 References:

- [1] Apache HTTP Server Project: Select 'Download From Here', <http://httpd.apache.org/>, April 2002, <http://www.apache.org/dist/httpd/>.
- [2] Sun Microsystems Web Page: Select 'Downloads', <http://java.sun.com>, January 2002, <http://java.sun.com/products/servlet/>.
- [3] Sun Microsystems Web Page: Select 'Archive Releases', <http://java.sun.com/j2se/>, January 2002, <http://java.sun.com/products/archive/index.html>.
- [4] Sun Microsystems Web Page: Select 'Download J2SE™ v1.4 Now!', <http://java.sun.com/j2se/1.4>, April 2002, <http://java.sun.com/j2se/1.4/download.html>.
- [5] Sun Microsystems Web Page: Select 'Product Shortcuts', JAVA 3D, <http://java.sun.com/products>, January 2002, <http://developer.java.sun.com/developer/onlineTraining/java3d/>.